Multi-Tech Model IAC-F696

Single Board Computer for CommPlete 4000 Server

USER'S MANUAL

MultiTech® Systems

CommPlete 400 Single Board Computer (IAC-F696)

User Guide

PN S000349A

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Revisions

Revision Level	*Date*	*Description*
A	05/21/04	Initial release.

Patents

This device covered by one or more of the following patents: 5.301.274, 5.309.562, 5.355.365, 5.452.289, and 5.453.986.
Other Patents Pending.

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World Headquarters

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, Minnesota 55112
Phone: 763-785-3500 or 800-328-9717
Fax: 763-785-9874

Technical Support

Country	By Email	By Phone
France:	support@multitech.fr	(33) 1-64 61 09 81
India:	support@multitechindia.com	91 (124) 6340778
U.K.:	support@multitech.co.uk	(44) 118 959 7774
U.S. and Canada:	oemsales@multitech.com	(800) 972-2439
Rest of the World:	oemsales@multitech.com	(763) 717-5863

Internet Address: http://www.multitech.com

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Chapter 1 – General Information

Introduction

IAC-F696 With its rich AGP V1.0 Compliant 2X integrated graphics capabilities, flexible FSB settings, and support for PC133 DRAM, delivers excellent levels of scalability and performance on a cost-effective, High integrated platform designed for the specific needs of the Automation, DVR, Information PC, and Internet Appliance market segments.

Low power VIA CPU + VIA Apollo PLE133P = Ultimate Value Combination

IAC-F696 optimizes the performance of the VIA Low power Processor while its integrated AGP 2X graphics engine delivers rich graphics capabilities for running 2D/3D software and Internet applications. Its highly scaleable asynchronous bus design also makes it the ideal solution for VIA low power processors running at 100/133MHz FSB speeds. With an advanced memory controller architecture, the IAC-F696 supports up to 1.5GB of high-speed PC133 SDRAM. These advanced memory technologies provide the bandwidth and performance necessary for even the most demanding Internet and 3D graphics applications. Further integrated CPU & multimedia & connectivity features that help minimize the cost of building automation and Internet Appliances without sacrificing features and performance include two Fast Ethernet controllers, integrated AGP 2X graphics, AC'97 audio, Super I/O, and advanced power management.

In addition, IAC-F696 features two IDE, one FDD port, two COM ports and one multi-mode parallel port allows for more devices support and more flexibility. Other standard features include one socket for Compact Flash, four USB headers and one IrDA header. IAC-F696 has also incorporated Watchdog Timer that allows for monitoring ability to ensure system stability.

Features

- VIA EBGA 1GHz CPU
- VIA VT8601T North Bridge and VT82C686B South Bridge
- Award BIOS
- Integrated AGP 2X Graphics Engine
- Dual Realtek RTL 8100C 10/100 Base-T Fast Ethernet
- 2 x EIDE, 1 x FDD, 2 x COM, 1 x LPT, Keyboard & Mouse, 4 x USB, 1 x IrDA and 1 x VGA
- Watchdog Timer
- ISA & PCI expansion bus (PICMG)

Technical Specification

IAC-F696 Series

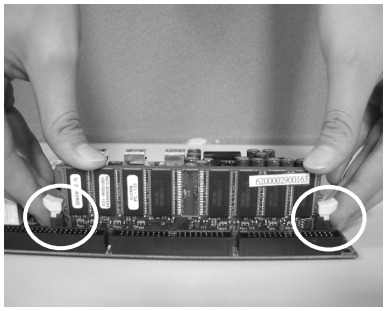
Processor System	CPU	VIA C3 EBGA 1GHz s
	Max. Speed	1GHz
	L2 Cache	Integrated 192KB Cache (two 64KB L1 Cache and 64KB L2)
	Chipset	VIA VT8601T (NB)+VT82C686B (SB)
	BIOS	Award® licensed BIOS (2M bit Flash ROM)
Bus	FSB	100/133MHz
	PCI	32-bit/33 MHz
Memory	Technology	PC-100/133
	Max. Capacity	1.5 GB
	Socket	Three 168-pin DIMM
Graphic	Controller	On-board integrated VGA controller
	VRAM	Share memory up to 8 MB
	Connector	One DB15 (VGA)/VT1631 LVDS connector
Ethernet	Controller	Dual Realtek 8100C X 2
	Interface	10/100 Base-T (FE)
	Connector	RJ-45
EIDE	Mode	ATA 100/66/33
	Channel	Two 20x2 Box header, support up to four devices
I/O Interface	FDD	One 17x2 Box header, support up to two devices
	Serial port	One DB9 (COM1: RS-232) and one 5 x 2 Box header (COM2: RS-232)
	Parallel port	One 13 x 2 Box header (SPP/EPP/ECP)
	PS/2	One mini-DIN6 PS/2 keyboard/mouse connector and one 5-pin keyboard wafer
	USB	Header for 4 ports (USB 1.1 compliant)
	IrDA	One IrDA compliant Infrared interface
Flash Memory Disk	CF Type-II at solder side	
Health Monitoring	System Temperature Alarm Sensor	
Expansion Bus	PCI & ISA (PICMG)	
I/O Bracket	COM1 (DB9) + LAN1 (RJ-45) + VGA(DB15) + PS/2(mini DIN)	
RTC	Internal RTC with Li battery	
Watchdog Timer	16-level time-out intervals	
Power Requirements	Standard ATX/AT Power	
Temperature	Operating	0 °C~60 °C
	Storage	-20 °C~70 °C
Dimensions	338 x 122 (13.3" x 4.8")	
EMI/EMS	EN 50081-1/1994>EN 55022/1997> EN 61000-3-2/1995>EN 61000-3-3/1995, EN 50082-1/1994>IEC 1000-4-2/1995, IEC 1000-4-3/1995, IEC 1000-4-4/1995	

CHAPTER 2 – INSTALLATION

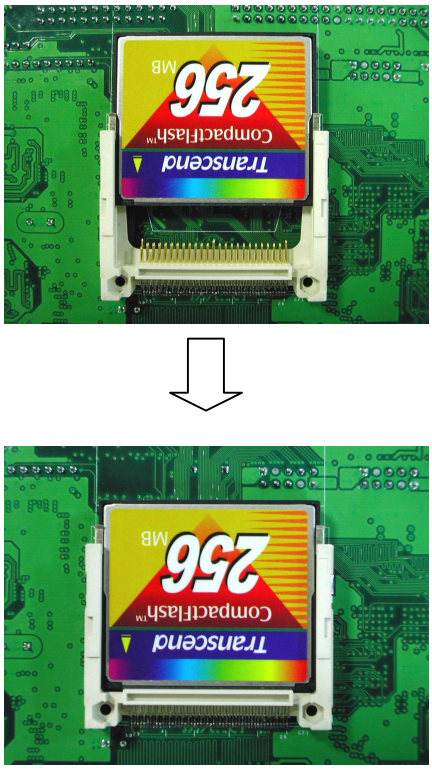
Hardware Setup and Installation

System Memory Installation

Step1: Open latches of DIMM socket.
Step2: Insert the RAM module into the DIMM socket.
Step3: Press the latches into the notches of the RAM module.

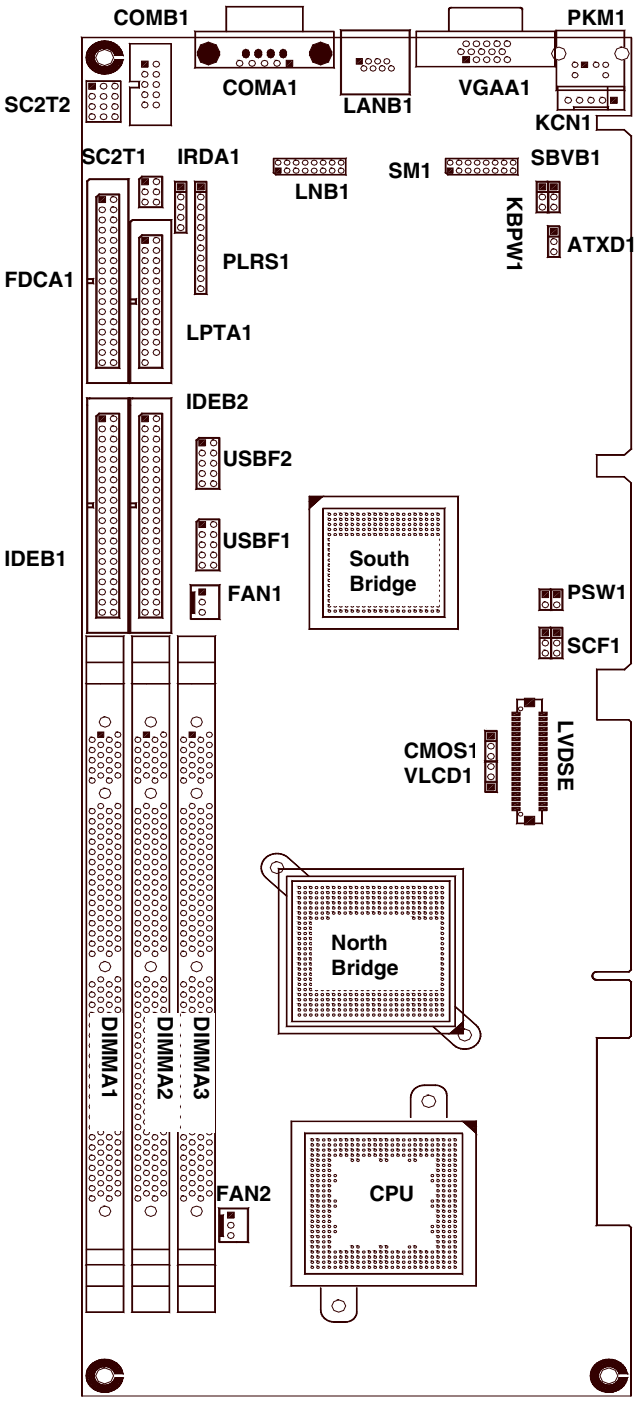


Compact Flash Installation



Jumper Settings and Connectors

Board Outline

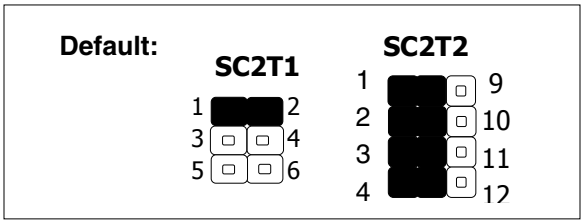


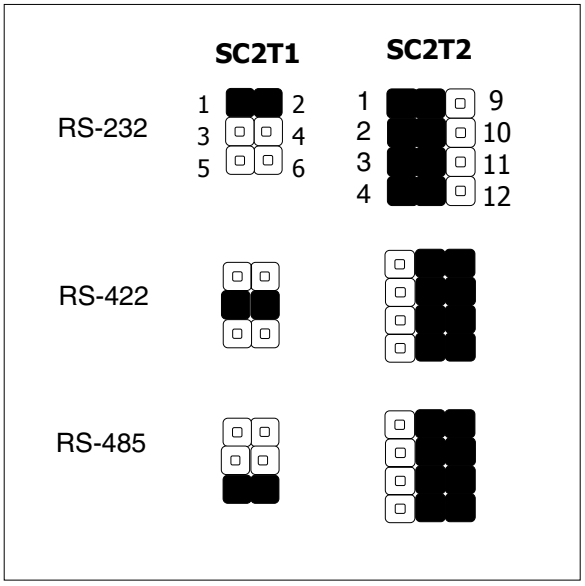
Jumper Settings Summary

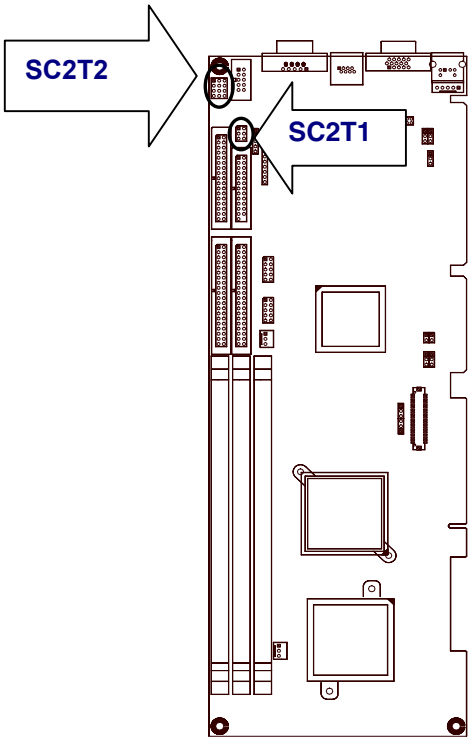
Jumper	Function
SC2T1/SC2T2	Select COM2 Type
VLCD1	Select Panel Voltage
CMOS1	Clear CMOS Data
PLRS1	Power LED, HD LED, Reset, Speaker Connector
SCF1	Master/Slave Select
KBPW1	PS/2 Keyboard/Mouse
SBVB1	Select power mode
SLVA1	12/24 Bit Input Mode Select

SC2T1/SC2T2: Select COM2 Type

COM2 TYPE	SC2T1	SC2T2
RS-232 (Default)	1-2	1-5,2-6,3-7,4-8
RS-422	3-4	5-9,6-10,7-11,8-12
RS-485	5-6	5-9,6-10,7-11,8-12



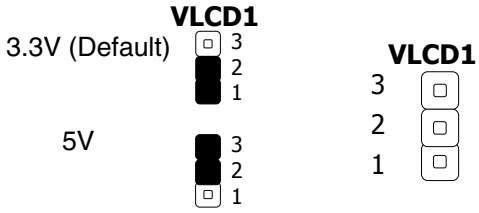


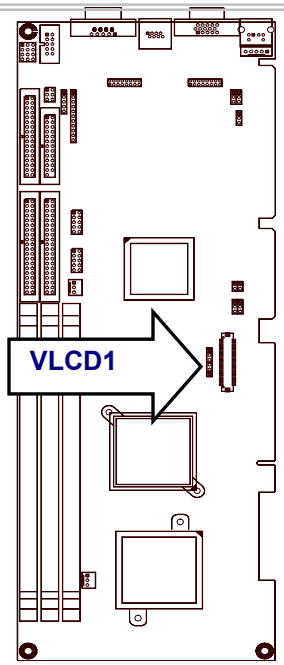


VLCD1: Select Panel Voltage

Panel Voltage	VLCD1
+3.3 V (Default)	1-2
+5 V	2-3

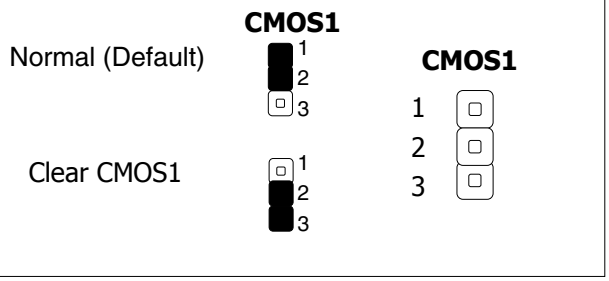
Default:

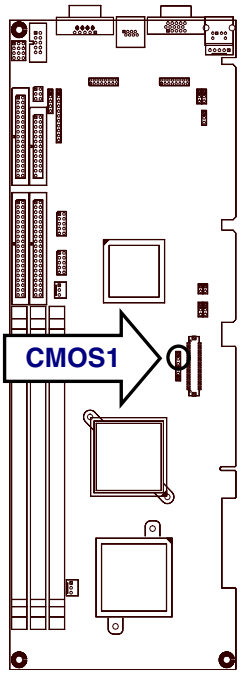




CMOS1: Clear CMOS Data

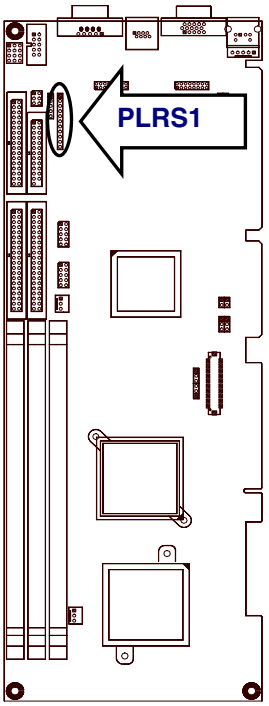
Description	CMOS1
Normal (Default)	1-2
Clear CMOS	2-3



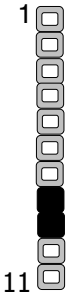


PLRS1: Power LED, HD LED, Reset, Speaker Connector (11 Pin 2.54mm)

Pin No.	Description
1	Power LED +
2	Power LED +
3	GND
4	HDD LED +
5	HDD LED -
6	RESET SW +
7	RESET SW – (GND)
8	External Speaker -
9	Internal Buzzer -
10	NC
11	External Speaker +



Default : 8-9 (ON) Internal Buzzer

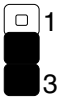


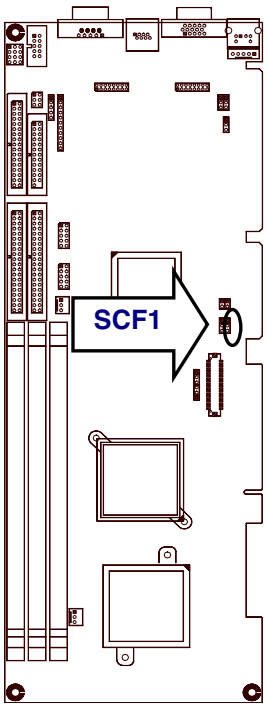
PLRS1

SCF1: Master/Slave Select

Compact Flash Card	ATA Disk Chip	SCF1	
Master	Slave	1-2	
Slave	Master	2-3	(Default)

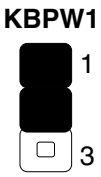
SCF1

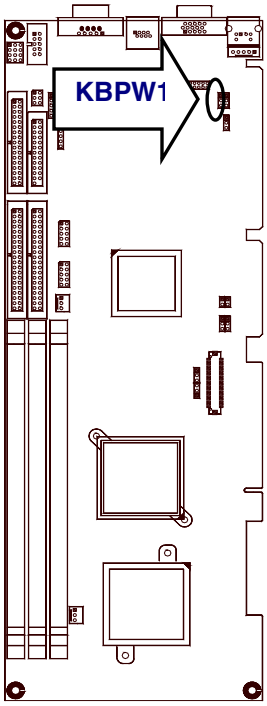




KBPW1: 1x3 Pin 2.54mm

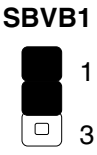
PS/2 Keyboard/Mouse	KBPW1
+5V (Default)	1-2
+5V STANDBY	2-3

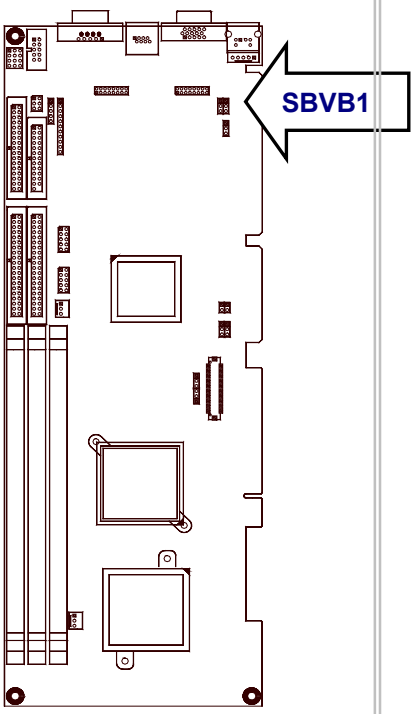




SBVB1: Select power mode

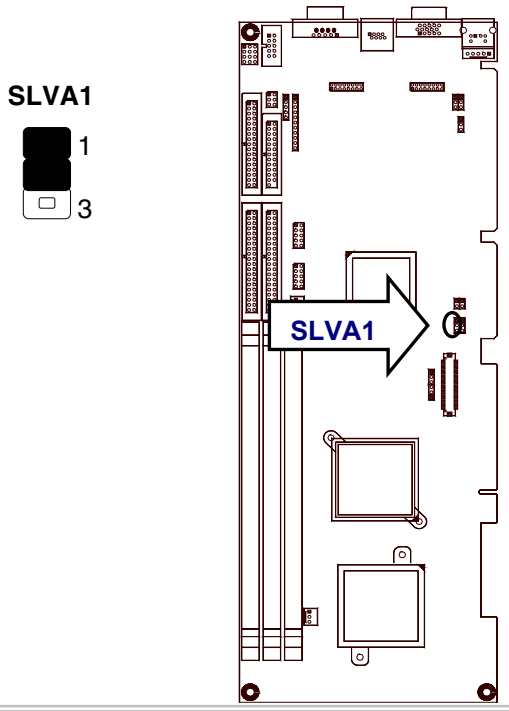
MODE	SBVB1
AT	1-2
ATX	2-3





SLVA1: 12/24 Bit Input Mode Select

Bit Input Mode Select	SLVA1
24 bits Mode	1-2 (Default)
12 bits Mode	2-3



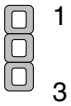
I/O Connector Summary

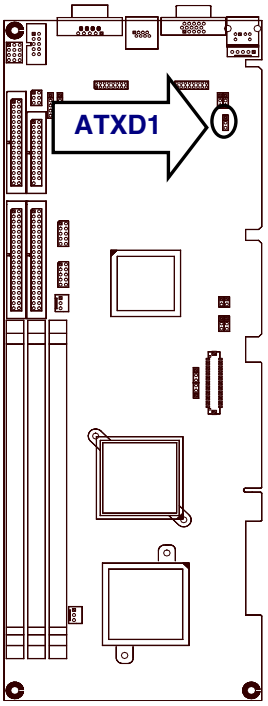
CONNECTOR	FUNCTION
ATXD1	For ATX Function
IRDA1	IRDA1 Connector
USBF1/ USBF2	USB Port #1 & #2 Connector (2×5 Pin 2.54mm)
FAN1/ FAN2	3 Pin FAN Connector
PSW1	ATX Power Button
IDEB1 / IDEB2	IDE Interface Connector (40Pin 2.54mm Pitch Header)
FDCA1	Floppy Interface Connector (34 Pin Header)
LPTA1	Parallel Connector (26 Pin 2.54mm Pitch Header)
COMA1	RS-232 Serial Port #1 Connector (D-Sub)
COMB1	Serial Port #2 Connector (Header)
LANB1	Type 2 (RJ-45 with LED)
VGAA1	External VGA Connector (15 Pin D-Sub)
PKM1	PS/2 Keyboard & Mouse Connector (6P Mini Din)
KCN1	5 Pin Keyboard Cable Connector
LNB1	LAN 2×8 Pin 2.0mm (Female/ Male)
SM1	Sound/ Mouse (2×8 Pin 2.0mm Female/ Male)
DIMMA1/2/3	168 Pin DIMM Connector
LVDSE1	LVDS Panel Connector 2×20P 1.25mm SMT

ATXD1: For ATX Function

Pin No.	Description
1	PSON
2	GND
3	+5V STANDBY

ATXD1

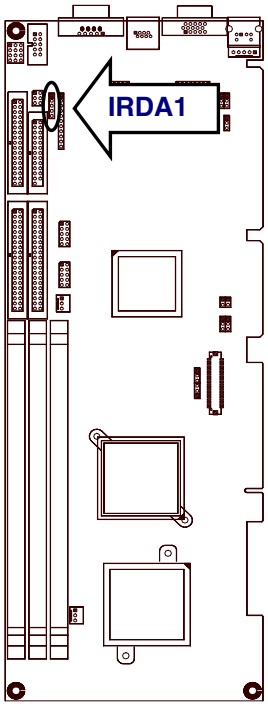




IRDA1: IRDA1 Connector

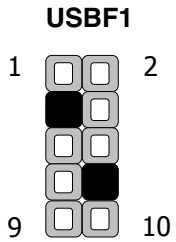
Pin No.	Description
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX

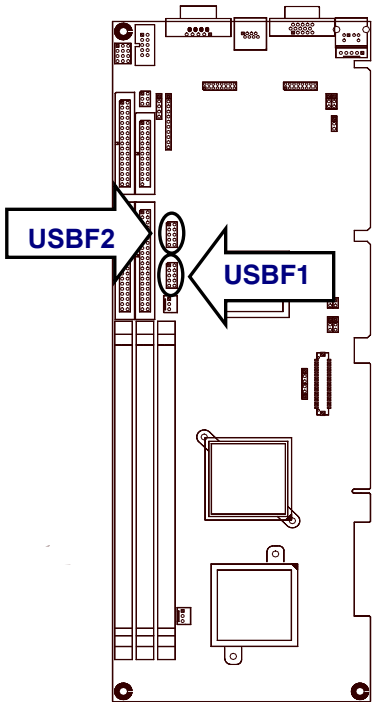
IRDA1



USBF1/USBF2: USB Port #1 & #2 Connector 2x5 Pin 2.54mm

Pin No.	Description	Pin No.	Description
1	USB_VCC	2	Ground
3	Key	4	USBD1+/3+
5	USBD0-/2-	6	USBD1-/3-
7	USBD0+/2+	8	Key
9	Ground	10	USB_VCC

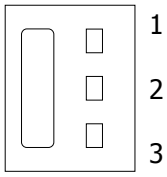


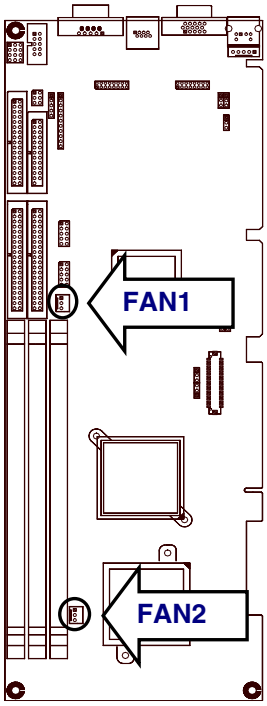


FAN1/FAN2: 3 Pin FAN Connector

Pin No.	Description
1	Ground
2	+12V
3	FAN Status

FAN1/2

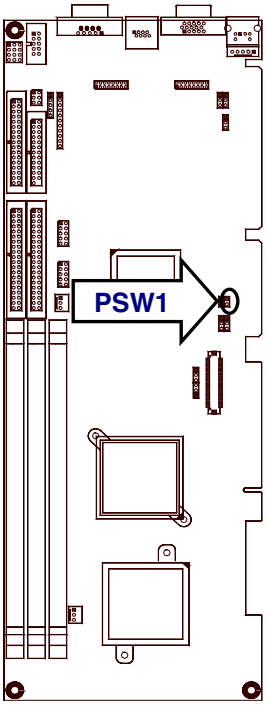




PSW1: For ATX Power Button

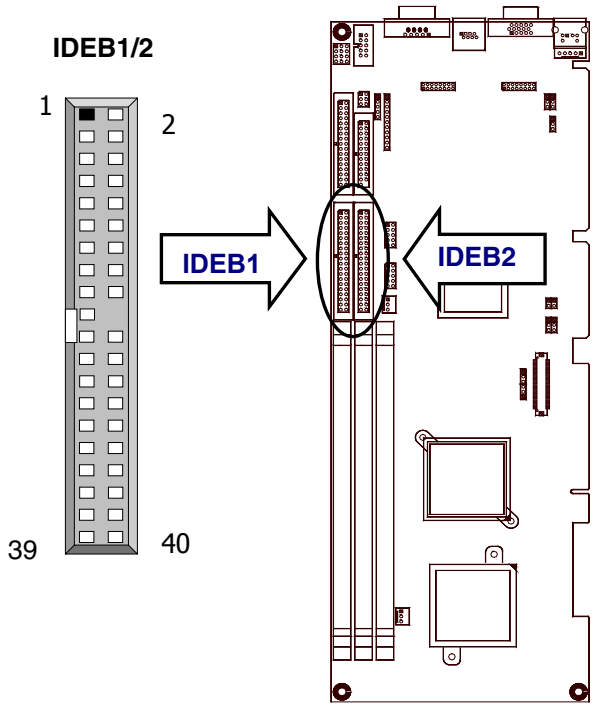
Pin No.	Description
1	PANSW
2	GND

PSW1



IDEB1/IDEB2: IDE Interface Connector (40Pin 2.54mm Pitch Header)

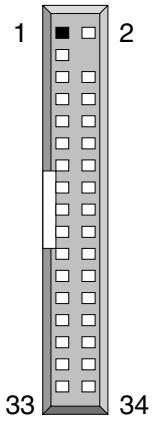
Pin No.	Description	Pin No.	Description
1	Reset #	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	KEY
21	DMA REQ#	22	Ground
23	IOW #	24	Ground
25	IOR #	26	Ground
27	IOCHRDY	28	Ground
29	DMA ACK #	30	Ground
31	Interrupt	32	NC
33	SA1	34	PD80P / SD80P
35	SA0	36	SA2
37	HDC CS0 #	38	HDC CS1 #
39	HDD Active LED #	40	Ground

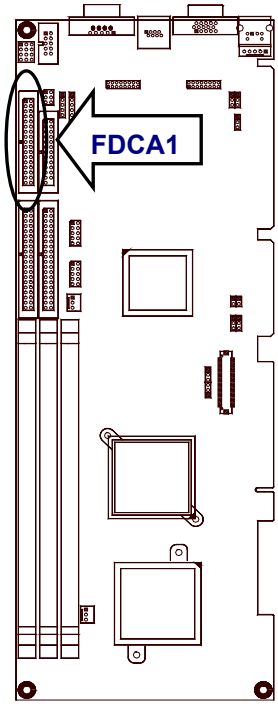


FDCA1: Floppy Interface Connector (34 Pin Header)

Pin No.	Description	Pin No.	Description
1	Ground	2	Density Select
3	Ground	4	KEY
5	Ground	6	DS1
7	Ground	8	Index #
9	Ground	10	Motor Enable A #
11	Ground	12	Drive Select B #
13	Ground	14	Drive Select A #
15	Ground	16	Motor Enable B #
17	Ground	18	Direction #
19	Ground	20	Step #
21	Ground	22	Write Data #
23	Ground	24	Write Gate #
25	Ground	26	Track 0 #
27	Ground	28	Write Protect #
29	NC	30	Read Data #
31	Ground	32	Head Side Select #
33	NC	34	Disk Change #

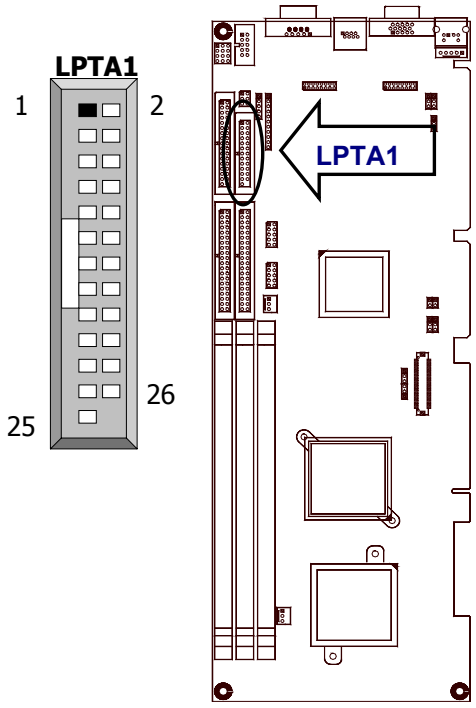
FDCA1





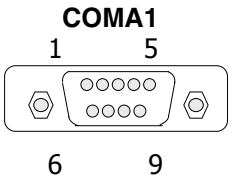
LPTA1: Parallel Connector (26 Pin 2.54mm Pitch Header)

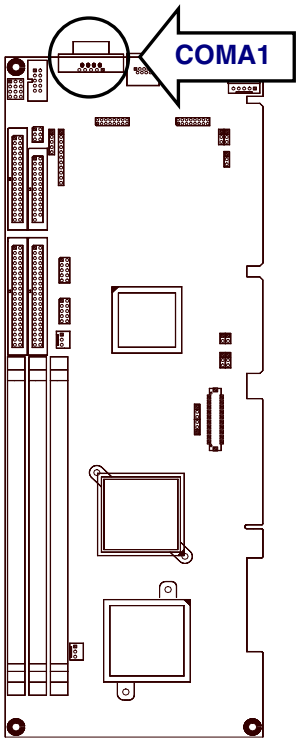
Pin No.	Description	Pin No.	Description
1	Strobe #	2	Auto Form Feed
3	Data0	4	Error #
5	Data1	6	Initialize #
7	Data2	8	Printer Select IN #
9	Data3	10	Ground
11	Data4	12	Ground
13	Data5	14	Ground
15	Data6	16	Ground
17	Data7	18	Ground
19	Acknowledge #	20	Ground
21	Busy	22	Ground
23	Paper Empty	24	Ground
25	Printer Select	26	KEY



COMA1: RS-232 Serial Port #1 Connector (D-Sub)

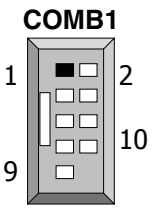
Pin No.	Description
1	Data Carrier Detect (DCDA #)
2	Receive Data (RXDA)
3	Transmit Data (TXDA)
4	Data Terminal Ready (DTRA #)
5	Ground (GND)
6	Data Set Ready (DSRA #)
7	Request To Send (RTSA #)
8	Clear To Send (CTSA #)
9	Ring Indicator (RIA #)

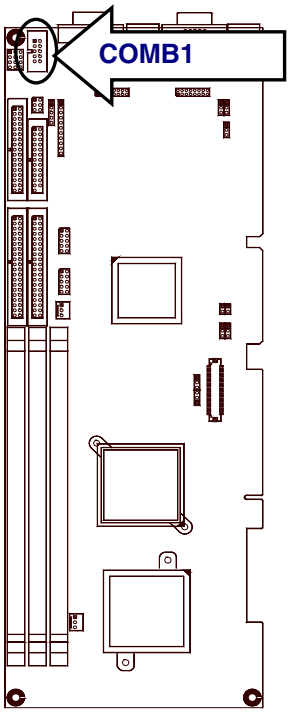




COMB1: Serial Port #2 Connector (Header)

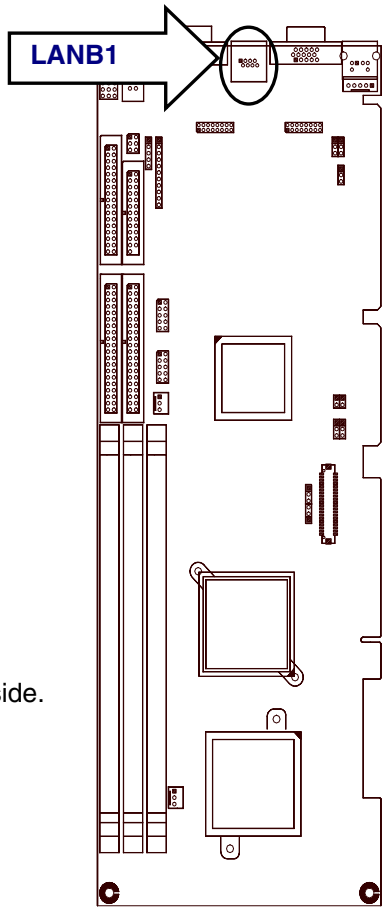
Pin No.	Description
	RS-232
1	Data Carrier Detect (DCDB #)
2	Data Set Ready (DSRB #)
3	Receive Data (RXDB)
4	Request To Send (RTSB #)
5	Transmit Data (TXDB)
6	Clear To Send (CTSB #)
7	Data Terminal Ready (DTRB #)
8	Ring Indicator (RIB #)
9	Ground
10	KEY



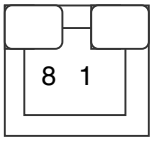


LANB1: Type 2 (RJ-45 with LED)

Pin No.	Description	
	Fast E-Net	Giga Net
1	TX+	MD0+
2	TX-	MD0-
3	RX+	MD1+
4	T45	MD2+
5	T45	MD2-
6	RX-	MD1-
7	T78	MD3+
8	T78	MD3-
9	10-/100-/1000+	
10	10+/100+/1000-	
11	Link+/ACT-	
12	Link-/ACT+	



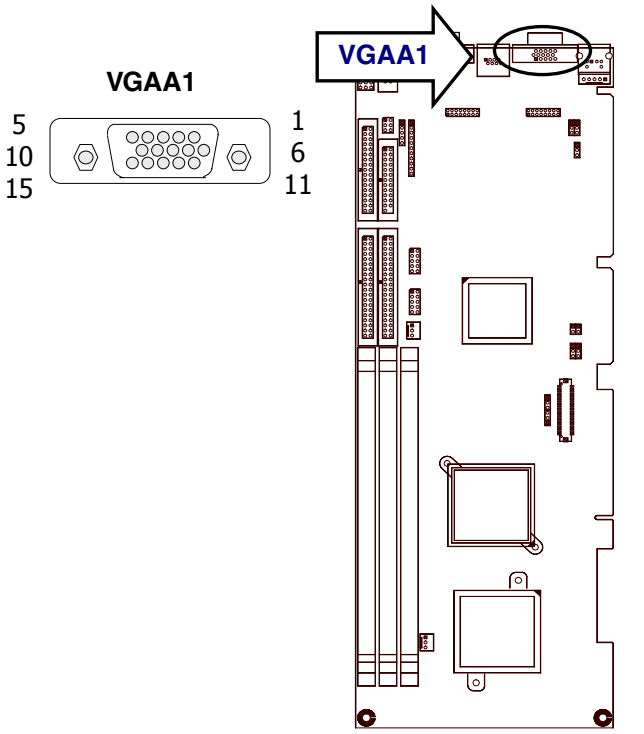
LANB1



∗ Pin9 to pin12 are on the solder side.

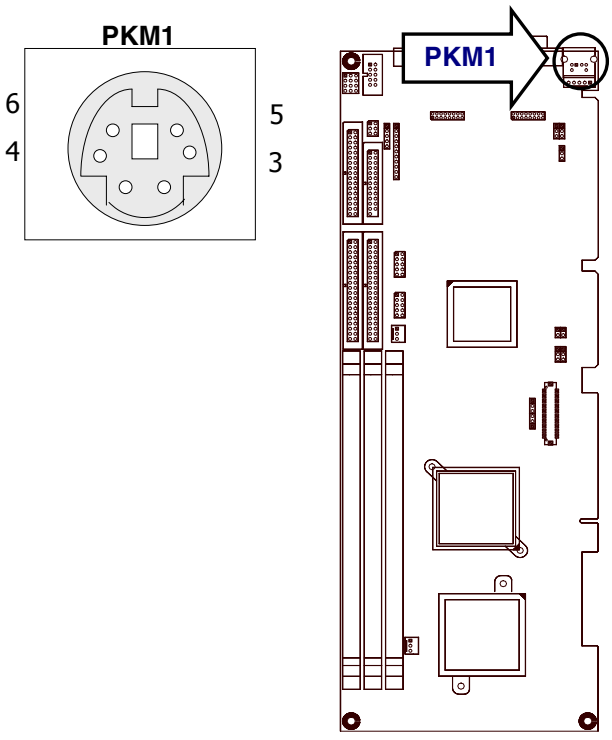
VGAA1: External VGA Connector (15 Pin D-Sub)

Pin No.	Description
1	Red Color Signal
2	Green Color Signal
3	Blue Color Signal
4	NC
5	Ground
6	Ground
7	Ground
8	Ground
9	NC
10	Ground
11	NC
12	DDC-DATA
13	H-Sync.
14	V-Sync.
15	DDC-CLK



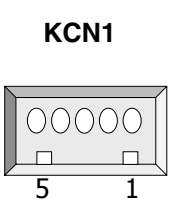
PKM1: PS/2 Keyboard & Mouse Connector (6P Mini Din)

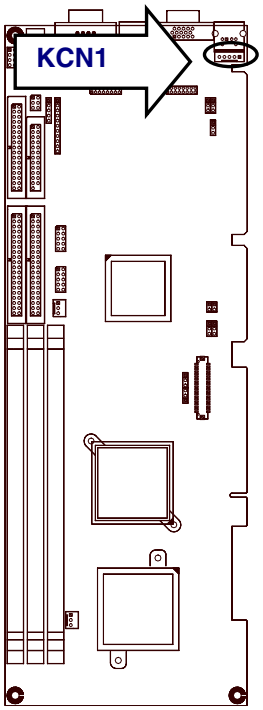
Pin No.	Description
1	PS/2 Keyboard Data
2	PS/2 Mouse Data
3	Ground
4	+5 V
5	PS/2 Keyboard Clock
6	PS/2 Mouse Clock



KCN1: 5 Pin Keyboard Cable Connector

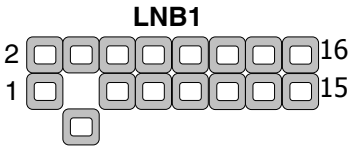
Pin No.	Description
1	Keyboard Clock
2	Keyboard Data
3	NC
4	Ground
5	+5V

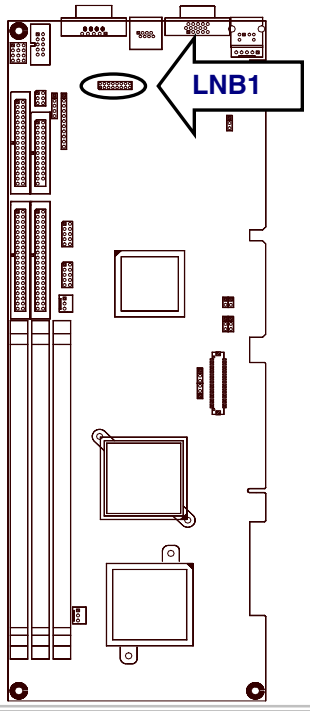




LNB1: LAN 2x8 Pin 2.0mm Female/Male

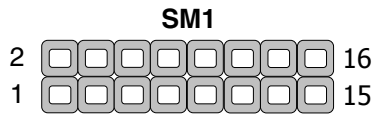
Pin No.	Description	Pin No.	Description
1	AMDI0+	2	ACTLD
3	AMDI0-	4	Vcc2_5
5	GND	6	3VSB
7	AMDI1+	8	GND
9	AMDI1-	10	LNKLD
11	AMDI2+	12	AMDI3+
13	AMDI2-	14	AMDI3-
15	LNK1G	16	LNK100

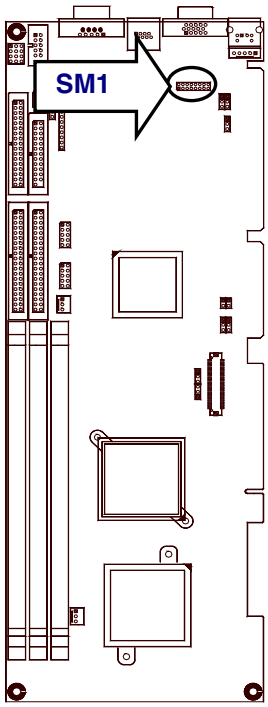




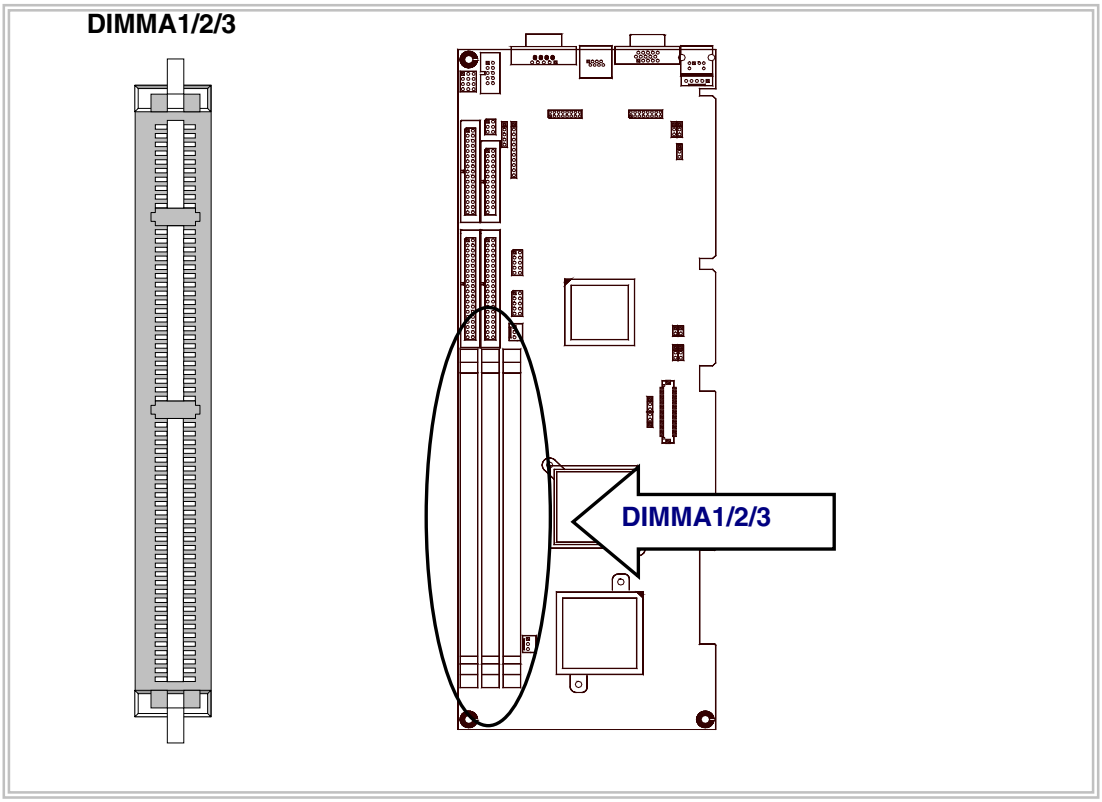
SM1: Sound/Mouse 2x8 Pin 2.0mm Female/Male

Pin No.	Description	Pin No.	Description
1	ICH_SPKR	2	AC97
3	AC_RST-	4	VCC
5	SYNC	6	GND
7	SDINO	8	+3.3V
9	NC	10	GND
11	BITCLK	12	+5V STANDBY
13	SDOUT	14	NC
15	MSDAT	16	MSCLK





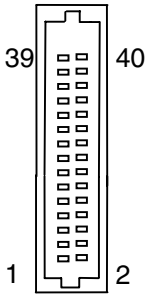
DIMMA1/2/3: 168 Pin DIMM Connector

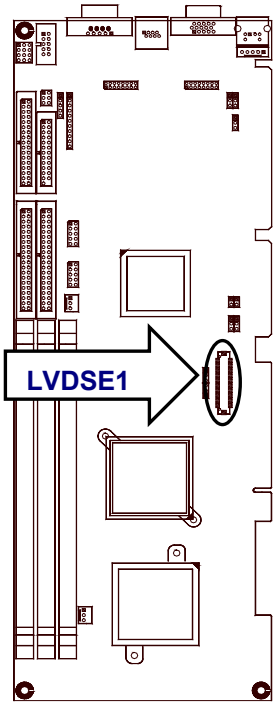


LVDSE1: LVDS Panel Connector 2x20P 1.25mm SMT

Pin No.	Description	Pin No.	Description
1	PVDD	2	A4M
3	PVDD	4	A4P
5	GND	6	GND
7	GND	8	A5M
9	A0M	10	A5P
11	A0P	12	GND
13	GND	14	A6M
15	A1M	16	A6P
17	A1P	18	GND
19	GND	20	CLK2M
21	A2M	22	CLK2P
23	A2P	24	GND
25	GND	26	A7M
27	CLK1M	28	A7P
29	CLK1P	30	GND
31	GND	32	NC
33	A3M	34	NC
35	A3P	36	ENPBLT
37	GND	38	ENPVEE
39	NC	40	ENPVDD

LVDSE1





CHAPTER 3 – BIOS SETUP

Phoenix Award's ROM BIOS provides a built-in Setup program that allows users to modify the basic system configuration and settings. The modified data will be stored in a battery-backed CMOS RAM so that this data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM remains unchanged unless there is a configuration change in the system, such as hard drive replacement or new equipment installment.

Running Phoenix AWARD BIOS

The Setup Utility is stored in the BIOS ROM. When the power of the computer system is turned on, a screen message will appear to give you an opportunity to call up the Setup Utility while the BIOS will enter the Power On Self Test (POST) routines. The POST routines perform various diagnostic checks while initializing the board hardware. If the routines encounter an error during the tests, the error will be reported in one of two ways, a series of short beeps or an error message on the screen. There are two kinds of errors, fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence. After the POST routines are completed, the following message appears:

Press DEL to enter SETUP

Entering Setup

Turn on the power of the computer system and press <Del> immediately. If you don't have the chance to respond, reset the system by simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys, or by pushing the Reset button on the system cabinet. You can also restart by turning the system OFF then ON.

CMOS Setup Utility

To access the AWARD BIOS SETUP program, press the <DEL> key. The screen display will appears as shown below:

Main Program Screen

Phoenix - Award BIOS CMOS Setup Utility

	Standard CMOS Features		PC Health Status
	Advanced BIOS Features		Load Optimized Defaults
	Advanced Chipset Features		Set Supervisor Password
	Integrated Peripherals		Set User Password
	Power Management Setup		Save & Exit Setup
	PnP/PCI Configurations		Exit Without Saving
Esc	: Quit	↑ ↓ → ←	: Select Item
F10	: Save & Exit Setup		
Time, Date, Hard Disk Type...			

This screen provides access to the utility's various functions.
Listed below is explanation of the keys displayed at the bottom of the screen:

<ESC> **:** Exit the utility.
<↑ ↓ → ←> **:** Use arrow keys ↑ ↓ → ← to move cursor to your desired selection.
<F1> **:** General Help
<F10> **:** Saves all changes made to Setup and exits program.

The following explains the options for each of the features as listed in the above menu:

Standard CMOS Features: Use this menu for basic system configurations.

Advanced BIOS Features: Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features: Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals: Use this menu to specify your settings for integrated peripherals.

Power Management Setup: Use this Menu to specify your settings for power management.

PnP/PCI Configurations: This entry appears if your system supports PnP/PCI.

PC Health Status: This entry shows your PC health status, if Hardware Monitor Chipset is installed.

Load Optimized Defaults: Use this menu to load the BIOS default values that are factory settings for optimal performance system operations.

Set Supervisor Password: Use this menu to set Supervisor Passwords.

Set User Password: Use this menu to set User Passwords.

Save & Exit Setup: Save CMOS value changes to CMOS and exit setup.

Exit Without Saving: Abandon all CMOS value changes and exit setup

Standard CMOS Setup

When you select the STANDARD CMOS SETUP on the main program, the screen display will appears as:

Standard CMOS Setup Screen

Phoenix - Award BIOS CMOS Setup Utility

Standard CMOS Features

Date (mm:dd:yy)	Fri, Oct 24, 2003	Item Help
Time (hh:mm:ss)	13 : 29 : 45	Menu Level ►
► IDE Primary Master	[None]	Change the day, month, year and century
► IDE Primary Slave	[None]	
► IDE Secondary Master	[None]	
► IDE Secondary Slave	[None]	
Drive A	[1.44M, 3.5 in.]	
Drive B	[None]	
Halt On	[All, But Disk/Key]	
Base Memory	640K	
Extended Memory	63488K	
Total Memory	64512K	

↑ ↓ → ← Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7:Optimized Defaults

The Standard CMOS Setup utility is used to configure the following components such as date, time, hard disk drive, floppy drive, display and memory. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

Set Date: Month, Date, Year

Set Time: Hour, Minute and Second. Use 24-hour clock format (for p.m. time, add 12 to the hour number, e.g. you would enter 4:30 p.m. as 16:30) Primary Master / Primary Slave.

Primary Master/Primary Slave

Secondary Master / Secondary Slave: Press PgUp / <+> or PgDn / <-> to select Manual, None, Auto type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Manual to define your own drive type manually.

If you select Manual, related information is asked to be entered to the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is SCSI, the selection shall be
[None]
If the controller of HDD interface is CD-ROM, the selection shall be
[None]

Here is a brief explanation of drive specifications:

- **Access Mode:** The settings are Auto, CHS, Large, LBA.
- **Cylinder:** Number of cylinders
- **Head:** Number of heads
- **Precomp:** Write precom
- **Landing Zone:** Landing Zone
- **Sector:** Number of sectors

Drive A and Drive B: Select the correct specifications for the diskette drive(s) installed in the computer.

None	No diskette drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

Note: 1. Not Installed could be used as an option for diskless workstations.
2. Highlight the listing after each drive name and select the appropriate entry.

Halt On: During the power-on-self-test (POST), the computer stops if the BIOS detect a hardware error. You can tell the BIOS to ignore certain errors POST and continue the boot-up process. These are the selections:

No errors	Whenever the BIOS detects a non-fatal error the system will not be stopped and you will be prompted
All errors	The system boot will be stopped for any error that may be detected.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

BIOS Features Setup

When you select the BIOS FEATURES SETUP on the main program, the screen display will appear as:

BIOS Features Setup Screen

Phoenix - Award BIOS CMOS Setup Utility

Advanced BIOS Features

		Item Help
Virus Warning	[Disabled]	Menu Level ►
Quick Power On Self Test	[Enabled]	Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
First Boot Device	[Floppy]	
Second Boot Device	[HDD-0]	
Third Boot Device	[CDROM]	
Boot Other Device	[Enabled]	
Swap Floppy Drive	[Disabled]	
Boot Up NumLock Status	[On]	
Security Option	[Setup]	
PS2 Mouse Function Control	[Enabled]	
HDD S.M.A.R.T Capability	[Enabled]	
Video BIOS Shadow	[Enabled]	
C8000 – CBFFF Shadow	[Disabled]	
CC000 – CFFFF Shadow	[Disabled]	
D0000 – D3FFF Shadow	[Disabled]	
D4000 – D7FFF Shadow	[Disabled]	
D8000 – DBFFF Shadow	[Disabled]	
DC000 – DFFFF Shadow	[Disabled]	
Full Screen LOGO Show	[Disabled]	

↑ ↓ → ← Move Enter: Select +/-/PU/PD: Value F10: Save Esc: Exit F1: General Help

F5: Previous Values F6: Fail-Safe Defaults F7:Optimized Defaults

The following explains the options for each of the features as listed in the above menu:

Virus Warning: The default setting of Virus Warning is Disabled. When it is enabled, any attempt to write the boot sector and partition table will halt the system and cause a warning message to appear. If this happens, you can use an anti-virus utility on a virus free, bootable floppy diskette to reboot, to clean and to investigate your system.

Quick Power on Self-Test: The default setting is Enabled. This speeds up the Power On Self Test (POST) by skipping some items that are normally checked during the full POST. If your system is functioning normally, you can choose this feature to speed up the booting process.

First / Second / Third / Other Boot Device: The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The settings are Floppy, LS/ZIP, HDD-0/ HDD-1/ HDD-2/ HDD-3, SCSI, CDROM, LAN, and Disabled.

Swap Floppy Drive: The default setting is Disabled. This setting gives you an option to swap A and B floppy disks. Normally, the floppy drive A is the one at the end of the cable and drive B is at the other end. If you set this option to Enabled, the Drive A will function as Drive B, and vice-versa under the DOS.

Boot Up NumLock Status: The default setting is On. If it set Off, the cursor controls will function on the numeric keypad.

Security Option: This setting controls the password in the main screen. The options are Setup and System. Select Setup and it will protect the Setup Utility settings from being tampered with. Select System if you want to use password feature every time the system boots up. The default setting is Setup. You can create your password by using the SUPERVISOR/USER PASSWORD utility on the main program screen.

PS/2 Mouse Function Control: The default setting is Enabled. If your system has a PS/2 mouse port and you install a serial pointing device, select Disabled.

HDD S.M.A.R.T Capability: SMART (Self-Monitoring, Analysis, and Reporting Technology) is a technology developed to manage disk drive reliability by predicting device failures. Award BIOS can warn of possible device failure, allowing time for backups or drive replacement.

Video BIOS Shadow: The default setting is Enabled which will copy the VGA display card BIOS into system DRAM to improve performance.

C8000-CBFFF Shadow to DC000-DFFFF Shadow: The default setting for the shadow feature is Disabled. When enabled, the ROM with the specific address is copied into system DRAM. It will also reduce the size of memory available to the system. After you have made your selection in the BIOS FEATURES SETUP, press the <ESC> key to go back to the main program screen.

Chipset Features Setup

When you select the CHIPSET FEATURES SETUP on the main program, the screen display will appears as:

Chipset Features Setup Screen

Phoenix - Award BIOS CMOS Setup Utility

Advanced Chipset Features

	DRAM Clock	[By Auto]	Item Help
	DRAM Timing By SPD	[Enabled]	Menu Level ▶
	SDRAM Cycle Length	3	
	Bank Interleave	Disabled	
	Memory Hole	[Disabled]	
	P2C/C2P Concurrency	[Enabled]	
	Fast R-W Turn Around	[Enabled]	
	System BIOS Cacheable	[Enabled]	
	Video RAM Cacheable	[Enabled]	
	Frame Butter Size	[8M]	
	AGP Aperture Size	[64M]	
	CPU to PCI Write Buffer	[Enabled]	
	PCI Dynamic Bursting	[Enabled]	
	PCI Master 0 WS Write	[Enabled]	
	PCI Delay Transaction	[Disabled]	
	PCI#2 Access #1 Retry	[Disabled]	
	AGP Master 1 WS Write	[Disabled]	
	AGP Master 1 WS Read	[Disabled]	
	Select Display Device	[CRT]	
	Panel Type	[1024×768]	

↑ ↓ → ← Move Enter: Select +/-/PU/PD: Value F10: Save Esc: Exit F1: General Help

F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

The following explains the options for each of the features as listed in the above menu:

DRAM Clock: Set the clock frequency of the DRAMs. The default is *HOST CLOCK*. You can select *HCLK+33M* if your DRAM modules are faster than CPU (eg. a 66Mhz FSB CPU with a PC100 SDRAM or a 100Mhz FSB CPU with PC-133 SDRAM) or select HCLK-33M for a faster CPU with slower SDRAMs. This selection is indeed important if you're thinking of overclocking a Pentium III to run beyond 133Mhz but only have PC-100 SDRAM

DRAM Timing By SPD: This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs.

SDRAM Cycle Length: This item allows you to select the SDRAM cycle length. The settings are 2 or 3.

Bank Interleave: Select the bank interleave. The default setting is Disabled.

Memory Hole: In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16MB.

P2C / C2P Concurrency: This item allows you to Enable or Disable the PCI to CPU, CPU to PCI concurrency. The default setting is Enabled.

Fast R-W Turn Around: This setting activates or deactivates a timing rapid of the cycles of lettura-scrittura. If memories of low quality are used or a system bus specifies outside deactivating this mode, not to have problems of instability of the system is advisable. Activating it with memories to high performance is possible. It is not possible to pretend resulted convincing from desks of memory of low quality.

System BIOS Cacheable: Selecting *Enabled* allows caching of the system BIOS ROM at F0000h - FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The settings are Enabled and Disabled.

Video RAM Cacheable: The choices: Enabled (Default) and Disabled.

Frame Butter Size: The choices: 2M, 4M, and 8M(Default).

AGP Aperture Size: Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The choices: 128M, 64M, 32M, 16M, 8M, and 4M.

CPU to PCI Write Buffer: When this field is Enabled, writes from the CPU to the PCI bus is buffered, to compensate for the differences between the CPU and the PCI bus. When disabled, the writes are not buffered and the CPU must wait until the write is complete before starting another cycle. The default setting is Enabled.

PCI Dynamic Bursting: This item allows you to enable or disable the PCI dynamic bursting function. The settings are Enabled or Disabled.

PCI Master 0 WS Write: When enabled, writes to the PCI bus and are executed with zero wait states. The settings are Enabled or Disabled.

PCI Delay Transaction: The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1. The settings are Enabled or Disabled.

PCI#2 Access #1 Retry: When disabled, PCI#2 will not be disconnected until access finishes. When enabled, PCI#2 will be disconnected if max retries are attempted without success. The default setting is Enabled.

AGP Master 1 WS Write: Implements a single delay when writing from the AGP Bus. Normally, two wait states are used, allowing for greater stability, but check with your motherboard manufacturer to see if they have already implemented a Master latency of zero, in which case the lowest writing here of 1 will reduce performance.

AGP Master 1 WS Read: Implements a single delay when reading from the AGP Bus. Normally, two wait states are used, allowing for greater stability, but check with your motherboard manufacturer to see if they have already implemented a Master latency of zero, in which case the lowest reading here of 1 will reduce performance.

Select Display Device: Select Display for CRT LCD Model.

Panel Type: Please select the type of panel you are incorporating with our single board computer. Consult your panel manual for detail information.

Integrated Peripherals

When you select the INTEGRATED PERIPHERIALS on the main program, the screen display will appears as:

Integrated Peripherals Setup Screen

Phoenix - Award BIOS CMOS Setup Utility

Integrated Peripherals

On-Chip Primary PCI IDE	[Enabled]	Item Help
On-Chip Secondary PCI	[Enabled]	Menu Level ▶
IDE	[Add-On Card]	
Init Display First	[Enabled]	
USB Controller	[Disabled]	
USB Keyboard Support	[Disabled]	
USB Mouse Support	[Auto]	
AC97 Audio	[Disabled]	
Onboard Lan Boot ROM	[Enabled]	
Onboard FDD Controller	[3F8/IRQ4]	
Onboard Serial Port 1	[2F8/IRQ3]	
Onboard Serial Port 2	[Normal]	
UART 2 Mode Select	Half	
UART 2 Duplex Mode	[378/IRQ7]	
Onboard Parallel Port 1	[SPP]	
Onboard Parallel Mode	[3]	
ECP Mode Use DMA	[Epp1.9]	
Parallel Port EPP Type		

↑ ↓ → ← Move Enter: Select +/-/PU/PD: Value F10: Save Esc: Exit F1: General Help

F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

The following explains the options for each of the features as listed in the above menu:

On-Chip Primary PCI IDE: The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface. The settings are Enabled and Disabled.

On-Chip Secondary PCI IDE: The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the secondary IDE interface. Select Disabled to deactivate this interface. The settings are Enabled and Disabled.

Init Display First: This item allows you to decide to active whether PCI Slot of VGA card or AGP first. The settings are Add-On Card and Onboard AGP.

USB Controller: Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals

USB Keyboard Support: Set this option to Enabled or Disabled the USB keyboard support. The default setting is Disabled.

USB Mouse Support: Set this option to Enabled or Disabled the USB mouse support. The default setting is Disabled.

AC97 Audio: This option sets the AC97 Audio. The settings are Auto and Disabled.

Onboard Lan Boot ROM: Unless you intend to boot using PXE Enabled/Disabled.

Onboard FDD Controller: Select Enabled if your system has a floppy disk controller (FDD) installed on the system board and you want to use it. If you install add-in FDD or the system has no floppy drive, select Disabled in this field. The settings are Enabled and Disabled.

Onboard Serial Port 1 / Port 2: Select an address and corresponding interrupt for the first and second serial ports. The settings are 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Disabled, Auto.

UART 2 Mode Select: This item allows you to select which mode for the Onboard Serial Port 2. The settings are Normal, HPSIR, and ASKIR.

UART 2 Duplex Mode: This item allows you to select the is half/full duplex function. The default setting is Half

Onboard Parallel Port 1: This item allows you to determine onboard parallel port controller I/O address setting. The settings are Disabled, 3BC/IRD7, 378/IRQ7, and 278/IRQ5.

Onboard Parallel Mode: There are four options SPP (default), EPP, ECP and ECP/EPP. Change the mode from *Normal* to the enhanced mode only if your peripheral device can support it. When it is set to ECP mode, the printer port always uses DMA3.

ECP Mode Use DMA: Select a DMA channel for the parallel port for use during ECP mode. The settings are 3 and 1.

Parallel Port EPP Type: Select EPP port type 1.7 or 1.9.

Power Management Setup

The Power Management Setup controls the CPU card's Green features. When you select the POWER MANAGEMENT SETUP on the main program, the screen display will appears as:

Power Management Setup Screen

Phoenix - Award BIOS CMOS Setup Utility

Power Management Setup

ACPI function	[Disabled]	Item Help
Power Management	[Press Enter]	Menu Level ▶
Video Off In Suspend	[Suspend -> Off]	
Video Off Method	[DPMS]	
Soft-Off by PWRBTN	[Instant-Off]	
********** Power On Events	*********	
Power On by LAN/Ring	[Disabled]	
Power On by RTC Alarm	[Disabled]	
Date (of Month)	0	
Resume Time (hh:mm:ss)	0:0:2	
PwrOn After AC Power Lose	[On]	

↑ ↓ → ← Move Enter: Select +/-/PU/PD: Value F10: Save Esc: Exit F1: General Help
F5: Previous Values F7: Optimized Defaults

The following explains the options for each of the features as listed in the above menu:

ACPI Function: This item allows you to enable or disable the Advanced Configuration and Power Management (ACPI). The settings are Enabled and Disabled.
Power Management:

Min. Power Saving	Minimum power management. Doze Mode=1hr. Standby Mode =1hr., Suspend Mode=1hr., and HDD Power Down=15min.
Max. Power Saving	Maximum power management. –Only available for SL CPU's. Doze Mode=1min., Standby Mode=1min., Suspend Mode=1min., and HDD Power Down=1min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges is from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disabled.

Video Off In Suspend: This determines the manner in which the monitor in which the monitor is blacked. The setting are YES and NO.
Video Off Method: This determines the manner in which the monitor is blanked. The default setting is V/H SYNC+Blank.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blank to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Soft-Off by PWRBTN: Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state. The settings are: Delay 4 Sec., and Instant-Off.
Power On by LAN/Ring: When Enabled, an input signal on the serial LAN/Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.
Power On by RTC Alarm: Power-on interval by RTC setting.
PwrOn After AC Power Lose: This option specifies the Power ON/OFF Status after AC power loss.

PnP/PCI Configuration

Both the ISA and PCI buses on the CPU card use system IRQs & DMAs. You must set up the IRQ and DMA assignments correctly through the PnP/PCI Configuration Setup utility; otherwise the motherboard will not work properly.

PnP/PCI Configuration Setup Screen

Phoenix - Award BIOS CMOS Setup Utility

PnP/PCI Configurations

		Item Help
PNP OS Installed	[No]	Menu Level ►
Reset Configuration Data	[Disabled]	Select Yes if you are using a Plug and Play capable operating system. Select No if you need the BIOS to configure non-boot devices.
Resources Controlled By	[Manual]	
► IRQ Resources	[Press Enter]	
► DMA Resources	[Press Enter]	
PCI/VGA Palette Snoop	[Disabled]	
Assign IRQ For VGA	[Enabled]	
Assign IRQ For USB	[Enabled]	
INT Pin 1 Assignment	[Auto]	
INT Pin 2 Assignment	[Auto]	
INT Pin 3 Assignment	[Auto]	
INT Pin 4 Assignment	[Auto]	

↑ ↓ → ← Move Enter: Select +/-/PU/PD: Value F10: Save Esc: Exit F1: General Help

F5: Previous Values F6: Fail-safe Defaults F7: Optimized Defaults

The following explains the options for each of the features as listed in the above menu:

PNP OS Installed: When set to Yes, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows® 95 or 98. When set to No, BIOS will initialize all the PnP cards. So, for non-PnP operating system (DOS, Netware®), this option must set to Yes.

Reset Configuration Data: Normally, you leave this field Disabled, Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot. The settings are: Enabled and Disabled.

Resource Controlled By: The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®98. If you set this field to Manual choose specific resources by going into each of the sub menu that follows this field (a sub menu is proceeded by a ►). The settings are Auto (ESCD), Manual.

IRQ Resources: When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt.

IRQ-3	assigned to	[Legacy ISA]	Item Help Menu Level ►►►
IRQ-4	assigned to	[Legacy ISA]	
IRQ-5	assigned to	[PCI /ISA PNP]	Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.
IRQ-7	assigned to	[Legacy ISA]	
IRQ-9	assigned to	[PCI /ISA PNP]	
IRQ-10	assigned to	[PCI /ISA PNP]	
IRQ-11	assigned to	[PCI /ISA PNP]	
IRQ-12	assigned to	[PCI /ISA PNP]	
IRQ-14	assigned to	[PCI /ISA PNP]	
IRQ-15	assigned to	[PCI /ISA PNP]	

DMA Resources: The sub menu can let you control the DMA resource.

DMA-0	assigned to	[PCI /ISA PnP]	Item Help Menu Level ►►►
DMA-1	assigned to	[PCI /ISA PnP]	
DMA-3	assigned to	[PCI /ISA PnP]	Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.
DMA-5	assigned to	[PCI /ISA PnP]	
DMA-6	assigned to	[PCI /ISA PnP]	
DMA-7	assigned to	[PCI /ISA PnP]	

PCI/VGA Palette Snoop: Leave this field at *Disabled*. The settings are *Enabled, Disabled*.

Assign IRQ for VGA: Enable/Disable to assign IRQ for VGA. The settings are Enabled and Disabled.

Assign IRQ for USB: Enable/Disable to assign IRQ for USB. The settings are Enabled and Disabled.

INT Pin 1/2/3/4 Assignment: These options specify the IRQ priority for PCI devices installed in the PCI expansion slots.

PC Health Status (Optional)

This section helps you to get more information about your system including CPU temperature, FAN speed and voltages. It is recommended that you contact your motherboard supplier to get proper value about your setting of the CPU temperature.

Phoenix - Award BIOS CMOS Setup Utility

PC Health Status

CPU Temperature	36º C/ 96º F	Item Help
System Temperature	29º C/ 80º F	Menu Level ▶
FAN1		
FAN2	0 RPM	
Vcore	+0.95 V	
+2.5V	+2.56 V	
+3.3V	+3.46 V	
+5V	+5.20 V	
+12V	+12.30 V	

↑ ↓ → ← Move Enter: Select +/-/PU/PD: Value F10: Save Esc: Exit F1: General Help

F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

The following explains the options for each of the features as listed in the above menu:

CPU Temperature: This item shows the CPU temperature.
System Temperature: This item displays the value of system temperature.
FAN1: This item displays the value of FAN1 speed.
FAN2: This item displays the value of FAN2 speed.
Vcore: This item shows the current system voltage.

Load Optimized Defaults

When you press Enter on this item, you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)? N

Pressing Y loads the default values that are factory settings for optimal performance system operations.

Phoenix - Award BIOS CMOS Setup Utility

▶Standard CMOS Features	▶PC Health Status
▶Advanced BIOS Features	Load Optimized Defaults
▶Advanced Chipset Features	Set Supervisor Password
▶Integrated Peripherals	ord
▶Power Management	
▶PnP / PCI Configurati	

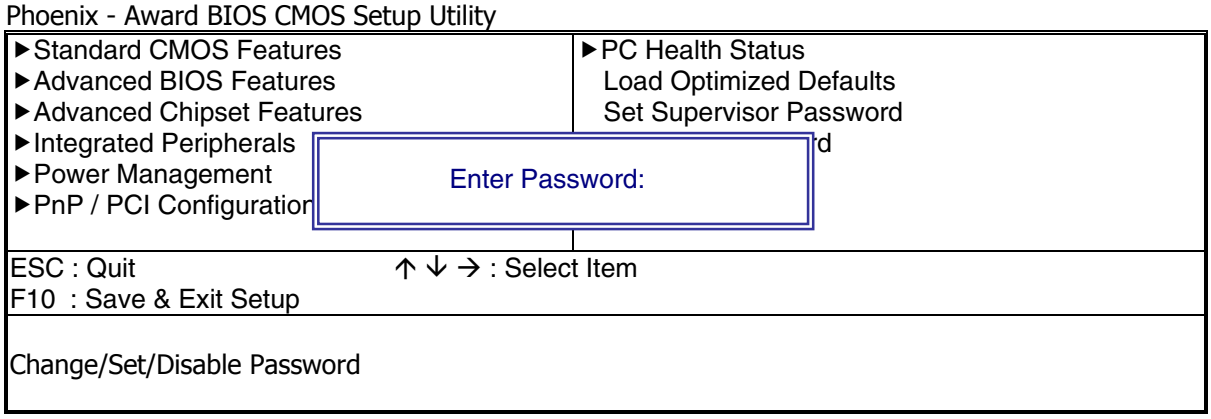
Load Optimized Defaults (Y/N)? N

ESC : Quit ↑ ↓ → ← : Select Item
F10 : Save & Exit Setup

Load Optimized Defaults

Set Supervisor / User Password

The SUPERVISOR/USER PASSWORD utility sets the password. The SBC is shipped with the password disabled. If you want to change the password, you must first enter the current password, then at the prompt -- enter your new password. The password is case sensitive, and can be up to 8 alphanumeric characters. Press <Enter> after you have finished typing in the password. At the next prompt, confirm the new password by re-typing it and pressing <Enter> again. When you are done, the screen automatically reverts to the main screen. Remember that when you use this feature, the Security Option line in BIOS FEATURES SETUP will determine when entering the password will be required.



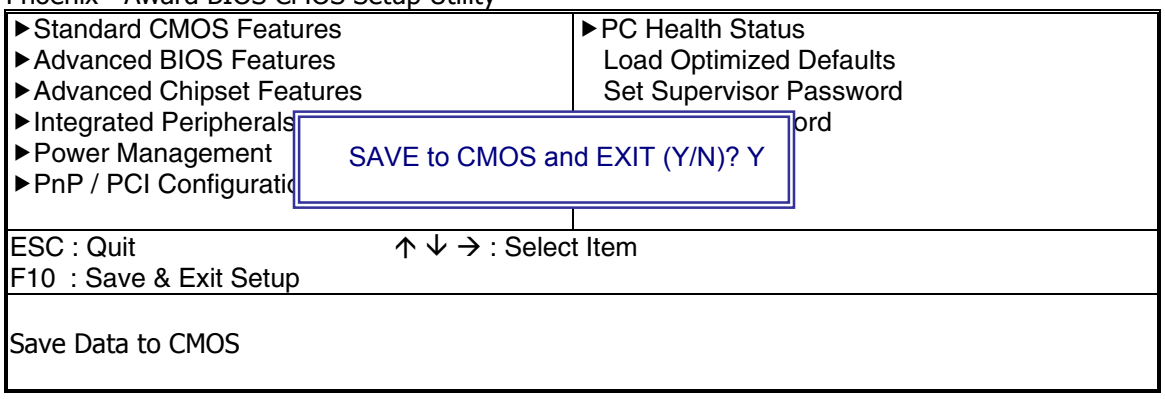
To disable the password, press the <Enter> key instead of entering a new password when the Enter Password in the dialog box appears. A message will appear confirming that the password is disabled.

If you have set both supervisor and user password, only the supervisor password allows you to enter the BIOS SETUP PROGRAM.

Note: If you forget your password, the only way to solve this problem is to discharge the CMOS memory.

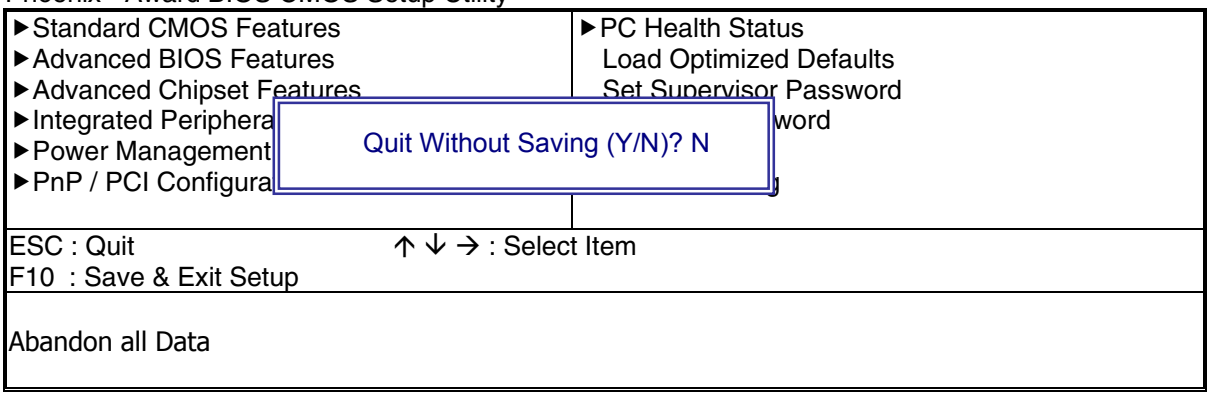
Save & Exit Setup

Select this option and press the <Enter> key to save the new setting information in the CMOS memory and continue with the booting process.



Exit Without Saving

Select this option and press the <Enter > key to exit the Setup Utility without recording any new values or changing old ones.



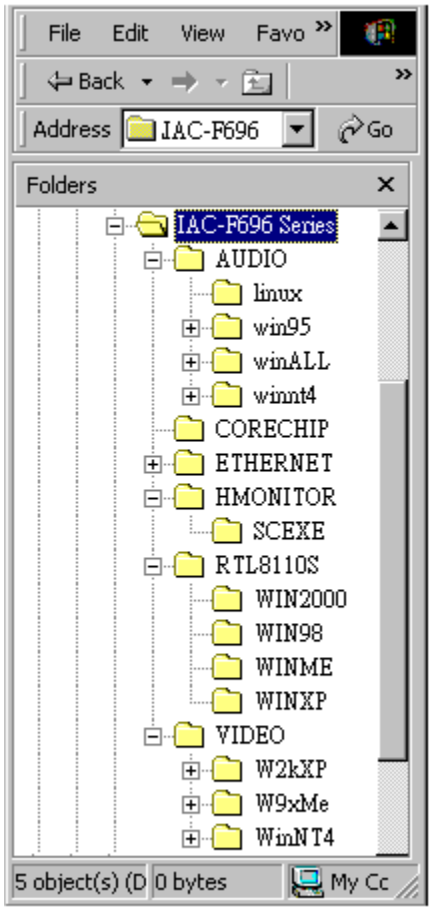
CHAPTER 4 – DRIVERS SUPPORT

Use Your Driver CD-ROM

This chapter provides information on how to install the drivers in generally and related directory that come with the CD-ROM in the package. Please follow the instructions set forth on the screen carefully.

1. Find the directory for your O/S accordingly.
2. Always read the README.TXT before installation
3. Run the *.EXE and follow the installation prompt step by step.

File Directory



APPENDIX A – WATCHDOG TIMER

You can enable the watchdog when your application software monitors an unexpected or not respond, then the timer generates a reset to reboot your system. During the period of enable to reset, you could still cancel reset by disabling the watchdog. Decide the way you want to set the period for reset by selecting hardware or software watchdog (if both of them are available). For hardware setting period, select period by jumper. For software setting period, normally setting hardware watchdog timer period to 2 sec.

Software watchdog using example.

EX.1: For DOS

Enable	Disable
C:\DOS> DEBUG	C:\DOS>DEBUG
-o443 D	-o441 F

EX.2: For assemble Language

Enable:	Disable:
MOV DX, 443H	MOV DX, 441H
MOV AL, 0FH	MOV AL, 0FH
OUT DX, AL	OUT DX, AL

Note: F is the period of software watchdog timer (normally F indicated 0 sec.). 0 to 9 and A to F are used for represent different period. Normally, the step is 2 sec. That means E is 2, D is 4, 2 is 26, 1 is 28 and 0 is 30 seconds.

APPENDIX B – WARRANTY

Multi-Tech Warranty Statement

Multi-Tech Systems, Inc., (hereafter "MTS") warrants that its products will be free from defects in material or workmanship for a period of two, five, or ten years (depending on model) from date of purchase, or if proof of purchase is not provided, two, five, or ten years (depending on model) from date of shipment.

MTS MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

This warranty does not apply to any products which have been damaged by lightning storms, water, or power surges or which have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by Customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products which prove to be defective within the warranty period or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory — transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES, AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PRICE FOR DEFECTIVE PRODUCTS.

Repair Procedures for U.S. and Canadian Customers

In the event that service is required, products may be shipped, freight prepaid, to our Mounds View, Minnesota factory:

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112
Attn: Repairs, Serial # _____

A Returned Materials Authorization (RMA) is not required. Return shipping charges (surface) will be paid by MTS to destinations in U.S. and Canada.

Please include, inside the shipping box, a description of the problem, a return shipping address (must have street address, not P.O. Box), your telephone number, and if the product is out of warranty, a check or purchase order for repair charges.

For out of warranty repair charges, go to www.multitech.com/DOCUMENTS/Company/warranty/

Extended two-year overnight replacement service agreements are available for selected products. Please call MTS customer service at (888) 288-5470 or visit our web site at www.multitech.com/PARTNERS/Programs/orc/ for details on rates and coverage's.

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department at (800) 972-2439 or email support@multitech.com. Please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at (800) 328-9717 or (763) 717-5631, or email mtsrepair@multitech.com.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Repair Procedures for International Customers (Outside U.S.A. and Canada)

Your original point of purchase Reseller may offer the quickest and most economical repair option for your Multi-Tech product. You may also contact any Multi-Tech sales office for information about the nearest distributor or other repair service for your Multi-Tech product. The Multi-Tech sales office directory is available at www.multitech.com/PARTNERS/Channels/offices/

In the event that factory service is required, products may be shipped, freight prepaid to our Mounds View, Minnesota factory. Recommended international shipment methods are via Federal Express, UPS or DHL courier services, or by airmail parcel post; shipments made by any other method will be refused. A Returned Materials Authorization (RMA) is required for products shipped from outside the U.S.A. and Canada. Please contact us for return authorization and shipping instructions on any International shipments to the U.S.A. Please include, inside the shipping box, a description of the problem, a return shipping address (must have street address, not P.O. Box), your telephone number, and if the product is out of warranty, a check drawn on a U.S.

bank or your company's purchase order for repair charges. Repaired units shall be shipped freight collect, unless other arrangements are made in advance.

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department nearest you or email support@multitech.com. When calling the U.S., please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at +(763) 717-5631 in the U.S.A., or email mtsrepair@multitech.com.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Repair Procedures for International Distributors

International distributors should contact their MTS International sales representative for information about the repairs for their Multi-Tech product.

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our International Technical Support department at +(763)717-5863. When calling the U.S., please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at +(763) 717-5631 in the U.S.A. or email mtsrepair@multitech.com.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Replacement Parts

SupplyNet, Inc., can supply you with replacement power supplies, cables and connectors for selected Multi-Tech products. You can place an order with SupplyNet via mail, phone, fax or the Internet at the following addresses:

Mail: SupplyNet, Inc.
614 Corporate Way
Valley Cottage, NY 10989

Phone: 800 826-0279

Fax: 914 267-2420

Email: *info@thesupplynet.com*

Internet: http://www.thesupplynet.com

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